is a decline in labor input at a rate of 1.1% per year. This is caused by the substantial decline in hours worked, which is partially offset by an increase in the composition index. Both the occupational mix and the experience level of the labor force contribute to this increase. From 1963 to 1970 the labor input index grows at 3.5% per year. This is due to the 3.9% per year growth in hours worked, which is partially offset by a decrease in the composition index. During this period there is a decrease in the experience level of the Bell labor force which causes the negative growth of the composition index. Between 1970 and 1977 hours worked declined slightly and the experience level and occupational mix improved, causing a growth of 0.9% per year in labor input. Between 1977 and 1979 labor input grows at 4.1% per year. This results from a 4.4% per year growth in hours worked, partially offset by a decrease in the composition index. This decrease is due to a change in the occupational mix of the labor force.

5. MEASUREMENT OF CAPITAL INPUT

We follow the methodology developed by Christensen and Jorgenson (1969) in constructing our capital accounts. This involves estimating the cost of capital, depreciation, revaluation, and taxation of several classes of capital goods.

There are some capital items which are rented by the Bell System. The rental payments must be separated into price and quantity components in order to combine owned and rented capital into an index of total capital input.

5.1. Owned Capital Stocks. We begin by computing perpetual inventory estimates of the stock of each type of capital used in the Bell System. In each year the stock of each type of capital is the sum of stocks remaining from past investments of each vintage. Under the assumption that efficiency of capital goods declines geometrically, the replacement rate, δ, is a constant. Capital stock at the end of every year can be estimated from investment during the year and capital stock at the end of the previous year:

$$K_t^A = I_t + (1-\delta)\, K_{t-1}^A,$$

where K_t^A is end of year capital stock and I_t is the quantity of investment. To estimate these stocks we therefore need a benchmark estimate of capital stock, investment in constant prices, and a rate of replacement. We estimate capital stocks for each of the 20 capital types given in Table 8.

All investment data are taken from the Quarterly Report No. 2A, Analysis of Changes in Telephone Plant Accounts. This report gives the book value of investments placed in service each year from 1947 to the present. Over this period there have been redefinitions of various accounts which need special treatment.

Table 8

Capital Type	Book Value of Investment	Book Value of Investment Deflator	Capital Stock Deflator	Capital Stock Benchmark	Replacement Rate
Data Source	All investment data are from Quarterly Report No. 2A, Analysis of Changes in Telephone Plant Accounts.	All deflators are from Telephone Plant Indexes. June refers to the year average price and Dec. to the end of year spot price.		All net plant figures are taken from Current Cost of Bell System Plant. All figures are in 1967 dollars.	CC refers to Current Cost of Bell System Plant.
Buildings	Account 212	June lagged one year i.e. June (-1)	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $2937.615 million	1947-1979: Rate implicit in CC stock, 1958-1978; .0270
Central Office Equipment: Manual	Account 221-Manual minus adjustment for 1/1/59 redefinition of sub-accounts in 221	June lagged 6 months i.e. 1/2(June + June (-1))	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $537.771 million	1947-1979: Rate implicit in CC stock 1970-1978; .16211
Central Office Equipment: Panel	Account 221-Panel minus adjustment for 1/1/59 redefinition of sub-accounts in 221	June lagged 9 months i.e. 1/4(3*June(-1) + June)	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $209.230 million	1947-1965: Rate implicit in CC stock, 1958-1965; .0816. 1965-1979: Rate implicit in CC stock, 1965-1980; .185
Central Office Equipment: Step by Step	Account 221-S×S minus adjustment for 1/1/59 redefinition of sub-accounts in 221	June lagged 6 months i.e. 1/2(June + June(-1))	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $1554.293 million	1947-1970: Rate implicit in CC stock, 1958-1970; .0642; 1970-1979: Rate implicit in CC stock 1970-1978; .1042

Table 8 (continued)

Capital Type	Book Value of Investment	Book Value of Investment Deflator	Capital Stock Deflator	Capital Stock Benchmark	Replacement Rate
Central Office Equipment: Crossbar	Account 221-Crossbar minus adjustment for 1/1/59 redefinition of sub-accounts in 221	June lagged 9 months i.e. 1/4(3*June(-1) + June)	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $1559.250 million	1947-1979: Rate implicit in CC stock, 1958-1978; .0539
Central Office Equipment: Circuit	Account 221-Toll plus Account 221-Circuit plus adjustment subtracted from all other COE accounts due to 1/1/59 redefinition	June lagged 6 months i.e. 1/2(June + June(-1))	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $1228.398 million	1947-1979: Rate implicit in CC stock, 1958-1978; .0735
Central Office Equipment: Radio	Account 221-Radio minus adjustment for 1/1/59 redefinition of sub-accounts in 221	June lagged 6 months i.e. 1/2(June + June(-1))	Dec.	Assume zero initial stock in 1948	1949-1979: Rate implicit in CC stock, 1958-1978; .0833
Central Office Equipment: Electronic	Account 221-Electronic	June lagged 9 months i.e. 1/4(3*June(-1) + June)	Dec.	Assume zero initial stock in 1963	1964-1979: Rate implicit in CC stock, 1965-1978; .031
Station Equipment: Station Apparatus	1947-1956: Account 231, a portion of accounts 234 and 235, all adjusted for redefinition of investment occuring 1/1/57. 1957-1976: Account 231	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $1123.524 million	1947-1956: .317 1956-1979: Rate implicit in CC stock, 1958-1978; .1144

Table 8 (continued)

Capital Type	Book Value of Investment	Book Value of Investment Deflator	Capital Stock Deflator	Capital Stock Benchmark	Replacement Rate
Station Equipment: Station Connections	1947-1956: Accounts 232 and 233 plus a portion of accounts 234 and 235, all adjusted for redefinition of investment occuring 1/1/57. 1957-1976: Account 232.	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $2598.114 million	1947-1958: .11 1958-1979: Rate implicit in CC stock, 1958-1978; .1337
Station Equipment: Large PBX	1947-1956: A portion of Account 234. 1957-1976: Account 234	June lagged 4 months i.e. 1/3(June(-1) + 2*June)	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $439.9891 million	1947-1970: Rate implicit in CC stock, 1958-1970; .0950; 1970-1979: Rate implicit in CC stock 1970-1978, .140
Pole Lines	Account 241	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $1543.178 million	1947-1979: Rate implicit in CC stock, 1958-1978; .0657
Cable: Aerial	Account 242.1	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $2893.361 million	1947-1979 Rate implicit in CC stock, 1958-1978; .0463
Cable: Underground	Account 242.2	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $1875.849 million	1947-1979 Rate implicit in CC stock, 1958-1978 .0284

Table 8 (continued)

Capital Type	Book Value of Investment	Book Value of Investment Deflator	Capital Stock Deflator	Capital Stock Benchmark	Replacement Rate
Cable: Buried	Account 242.3	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $666.440 million	1947-1979: Rate implicit in CC stock, 1958-1978 .0383
Cable: Submarine	Account 242.4	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $74.81371 million	1947-1979: Rate implicit in CC stock, 1958-1978; .0657
Aerial Wire	Account 243	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $468.569 million	1947-1965: Rate implicit in CC stock, 1958-1965; .1168. 1966-1979: Rate implicit in CC stock, 1965-1978 .1645
Underground Conduit	Account 244	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $1401.958 million	1947-1979: Rate implicit in CC stock, 1958-1978; .0256
Furniture and Office Equipment	Account 261	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $220.746 million	1947-1979: Rate implicit in CC stock, 1958-1978; .0822

Table 8 (continued)

Capital Type	Book Value of Investment	Book Value of Investment Deflator	Capital Stock Deflator	Capital Stock Benchmark	Replacement Rate
Vehicles and Other Work Equipment	Account 264	June	Dec.	Net plant 12/31/58 deflated by capital stock deflator: $228.516 million	Vintage Stock. 1947-1958: .21 1958-1976: Rate implicit in CC stock, 1958-1970 given above vintage; .1802

In 1959 the "Toll" category of Central Office Equipment (COE) was dropped and "Circuit" started. The new Circuit category includes all the former Toll category plus portions of four COE categories: Manual, Panel, Step-by-Step, Crossbar, and Radio We therefore combine the Toll and Circuit investment and add small portions of the above COE investments from 1947 to 1959 to obtain a consistent "Toll and Circuit" investment series. The gross book value of the stock transferred from each of these COE categories to Circuit in 1959 is available in the Quarterly Report No. 2A. For each COE category, we computed the ratio of the gross book value of the stock transferred out to the total gross book value of the stock. This ratio was applied to total investment in each year prior to 1959 to estimate the value of investment transferred to Toll and Circuit.

Station Equipment was the second group requiring adjustment. After 1957 this category has three capital types, Station Apparatus, Station Connections, and Large Private Branch Exchanges (PBX). Before 1959 there were two additional categories, and the PBX category included Small PBX. An additional complication is that investment prior to 1957 did not include some investment "waiting for installation" but after 1957 it did. We decided to use the three categories of investment after 1957 and consequently had to allocate the five categories of investment from 1947 to 1956 to the three more aggregated categories. This was done on the basis of a memo from the Economic Studies Department of AT&T estimating the gross book value of these three stocks, had the 1957 definition been in effect. The result is consistent series for the three investment categories over the entire 1947-79 period.

The next step was to deflate the book value of investment by an appropriate price deflator to estimate real investment. Price indexes for each capital type were taken from Bell System Telephone Plant Indexes. As the book value deflator should

reflect the price at which these investments were contracted for rather than the price prevailing when the asset was put in service, we deflate the book value of investment by the appropriate end-of-year price index lagged by the average interval between the date at which the construction contract price is set and the date the plant is placed in service. Table 8 specifies the length of the lag for each capital type. To estimate the current value of the real investment we then value it at the current end-of-year price. This current value differs from the book value of investment by the revaluation which has taken place between the contract date and the current end-of-year price. This end-of-year price index is also used to value the capital stock.

In most cases our capital stock benchmark comes from Current Cost of Bell System Plant. For each capital type we take the 1958 end-of-year net capital stock and deflate it by the appropriate end-of-year price deflator. The only exceptions to these are COE:Radio and COE:Electronic. Investment in these capital types starts after 1947, thus we can start with a zero initial stock in the year prior to the first year of investment.

In determining replacement rates we again used the Current Cost of Bell System Plant. For all capital types we started by using the end-of-year net capital stock figures in 1958, 1965, 1970, and 1978 annual investment data to estimate the implicit declining balance replacement rate in the periods 1958-1965, 1965-1970, 1970-1978, 1958-1970, and 1958-1978. These are years in the sample in which actual surveys of Bell System capital stock occurred. We believe they provide reliable benchmarks. For example, we assume

$$K_{1970} = (1-\delta)\, K_{1969} + I_{1970}$$

where K_i is the end-of-year real capital stock in year i, δ is the replacement rate

and I_i is investment in year i. Recursively substituting for K_{i-1} we obtain

$$K_{1970} = I_{1970} + (1-\delta)\ I_{1969} + (1-\delta)^2\ I_{1968} + (1-\delta)^3\ I_{1967}$$

$$+ (1-\delta)^4\ I_{1966} + (1-\delta)^5\ K_{1965}$$

Solving this equation for δ and choosing the solution between 0 and 1, we obtain the declining balance replacement rate implicit in the AT&T 1965 and 1970 capital stocks. In most cases the 1958-1978 rate was used to generate our capital stocks. In three cases however the implicit rate in the sub-periods was significantly different due to recent high obsolescence. These out-of-date capital types are now being written off at a rapid rate not appropriate in our early period, especially prior to 1958. Therefore with Aerial Wire we use two replacement rates. For 1947 to 1965 we use the rate implicit in AT&T 1958 and 1965 stocks and for 1966 to 1979 use the rate implicit in the AT&T 1965 and 1978 stocks. For COE: step by step and Large PBX we also use two rates. For 1947 to 1970 we use the rate implicit in AT&T 1958 and 1970 stocks and for 1970 to 1979 we use the rate implicit in the AT&T 1970 and 1978 stocks.

There are four other special cases. The first is COE: Panel. This type of COE is now obsolete; all equipment will be retired by 1981. We therefore use two rates. For 1947 to 1965 we use the rate implicit in AT&T 1958 and 1965 stocks. Past 1965 we use the rate implicit in the 1965 stock and a zero stock in 1981.

In both Station Apparatus and Vehicles and Other Work Equipment the AT&T implicit replacement rate gave negative stocks in the early years and

consequently a higher rate must have been appropriate before 1958. We therefore used higher replacement rates before 1958 and rates implicit in the AT&T 1958 and 1978 stocks thereafter. We also used two depreciation rates for Station Connections. The average service lives used for depreciation rates by Bell System companies showed significantly longer service lives before 1957 than later. We therefore used a .1 depreciation rate before 1958 and the rate implicit in the AT&T 1958 and 1978 stocks thereafter. The actual values of all replacement rates used are given in Table 8. Our estimated owned capital stocks and their deflators are given in Table 9. The aggregate capital stock is a Tornqvist index of all capital stock types. Table 10 shows the shares of individual assets in value of total tangible assets for selected years.

5.2. Capital Input from Owned Capital. In order to construct a quantity index of capital input we require relative shares of capital service flows. In the absence of taxation, the value of capital services for a particular asset is the sum of the cost of capital and depreciation, less revaluation:

$$(1) \qquad p_{Kt} K_t = [p_{A,t-1} r_t + p_{At} \delta - (p_{At} - p_{A,t-1})] K^A_{t-1}$$

Given the quantity of each type of asset held, K^A_{t-1}, the acquisition price, p_{At}, and the rate of replacement, δ, only the cost of capital, r_t, is required to compute capital services for each type of asset. For r_t we use the embedded cost of capital used for capital budget planning in the Bell System. This formula is appropriate for a single class of assets. For several classes of assets, property compensation is the sum of price times quantity of capital services for all classes of assets. We assume that the cost of capital is the same for all assets held by the Bell System. The cost of capital is presented in Table 11.

Table 9

Owned Capital Stock
(Quantity Indexes in Millions of 1967 Dollars)

Year	Buildings		COE:Manual		COE:Panel		COE:Step by Step		COE:Crossbar	
	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1946	1392.8	.474	602.0	.616	161.3	.784	652.1	.692	261.4	.906
1947	1520.7	.531	662.6	.659	188.9	.844	733.7	.747	338.0	.968
1948	1772.2	.566	722.2	.681	215.7	.837	839.1	.707	468.5	.912
1949	1978.9	.588	698.7	.685	221.1	.833	923.3	.711	583.1	.909
1950	2028.5	.603	650.9	.741	218.5	.897	965.8	.768	649.0	.967
1951	2068.6	.631	610.3	.726	216.5	.874	1007.8	.756	693.9	.950
1952	2131.4	.652	601.8	.666	216.2	.808	1048.5	.681	741.3	.847
1953	2223.8	.672	625.7	.681	219.4	.823	1142.6	.689	823.4	.851
1954	2355.7	.691	611.4	.691	220.3	.820	1224.0	.693	934.9	.856
1955	2453.7	.721	574.0	.703	217.2	.873	1291.4	.744	1048.3	.893
1956	2614.2	.751	572.2	.728	216.0	.913	1377.6	.775	1202.3	.930
1957	2826.4	.772	575.1	.797	216.0	.967	1508.7	.820	1430.1	.991
1958	3016.9	.792	559.8	.789	216.6	.936	1594.7	.816	1613.8	.966
1959	3128.4	.804	519.1	.791	220.0	.927	1640.6	.827	1745.3	.958
1960	3267.4	.809	488.1	.784	221.1	.899	1720.0	.814	1877.1	.943
1961	3413.6	.815	449.3	.797	225.9	.884	1783.3	.826	2008.1	.914
1962	3545.9	.830	419.0	.839	236.4	.889	1844.8	.836	2341.9	.905
1963	3693.6	.852	386.5	.849	238.6	.912	1885.5	.876	2612.2	.922
1964	3881.5	.877	350.4	.853	238.1	.905	1934.7	.874	2862.0	.917
1965	4125.3	.909	324.5	.905	240.5	.902	2002.3	.925	3119.0	.905
1966	4373.1	.951	304.8	.921	212.3	.933	2068.6	.950	3391.5	.933
1967	4557.4	1.000	288.7	1.000	190.6	1.000	2121.3	1.000	3653.8	1.000
1968	4748.0	1.060	284.8	1.050	174.8	1.061	2161.6	1.058	3842.8	1.060
1969	4967.6	1.144	273.1	1.111	160.0	1.093	2222.1	1.108	4157.1	1.092
1970	5293.1	1.248	247.6	1.158	149.7	1.175	2301.1	1.172	4529.6	1.174
1971	5669.2	1.360	242.7	1.294	137.5	1.243	2333.9	1.298	4958.7	1.243
1972	6020.4	1.471	235.0	1.313	120.2	1.254	2354.7	1.312	5493.5	1.252
1973	6413.5	1.631	217.6	1.432	92.9	1.373	2368.3	1.429	6029.3	1.365
1974	6701.2	1.879	198.5	1.689	72.0	1.583	2346.0	1.679	6439.3	1.614
1975	6921.6	2.029	184.9	1.839	55.0	1.721	2288.8	1.829	6703.9	1.757
1976	7113.1	2.151	162.3	1.997	39.0	1.873	2189.3	1.982	6705.6	1.908
1977	7237.7	2.301	141.4	2.151	18.4	1.968	2083.0	2.132	6653.5	2.026
1978	7291.0	2.540	122.5	2.169	4.7	2.049	1962.1	2.156	6605.6	2.045
1979	7369.0	2.732	104.9	2.202	1.6	2.088	1849.2	2.188	6531.6	2.068

Table 9 (continued)

Year	COE:Toll		COE:Radio		COE:Electronic		Station Equipment: Station Apparatus		Station Equipment: Station Connections	
	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1946	93.0	1.019	.0	.949	.0	.000	492.8	1.108	1586.0	.538
1947	171.9	1.061	.0	.999	.0	.000	488.1	1.108	1647.0	.575
1948	282.9	1.036	.0	1.012	.0	.000	526.2	1.069	1729.7	.593
1949	345.2	1.012	18.3	.992	.0	.000	548.0	1.107	1796.1	.589
1950	369.3	1.000	31.6	1.000	.0	.000	568.9	1.251	1867.8	.604
1951	412.9	1.076	46.7	1.051	.0	.000	581.7	1.251	1906.2	.630
1952	483.3	.947	62.5	.949	.0	.000	618.2	1.091	2000.9	.652
1953	602.1	.961	88.2	.968	.0	.000	674.7	1.098	2151.1	.670
1954	707.3	.974	126.4	.978	.0	.000	736.7	1.102	2237.6	.678
1955	762.9	.960	141.5	.934	.0	.000	839.6	1.078	2371.9	.674
1956	864.3	1.000	160.2	.929	.0	.000	965.0	1.079	2348.9	.701
1957	1052.0	1.048	197.9	.948	.0	.000	1072.0	1.065	2513.5	.740
1958	1254.2	1.038	248.9	.944	.0	.000	1153.9	1.078	2642.3	.750
1959	1394.2	1.000	274.6	.935	.0	.000	1279.2	1.014	2734.7	.782
1960	1576.5	.993	313.7	.937	.0	.000	1403.5	1.006	2827.4	.806
1961	1813.5	.992	368.4	.919	.0	.000	1548.6	.987	2924.1	.825
1962	2006.1	.963	437.7	.919	.0	.000	1726.6	.976	3046.1	.850
1963	2367.1	1.009	496.5	.944	.0	.000	1863.6	.974	3162.3	.869
1964	2707.2	.974	588.1	.921	1.4	1.000	2004.6	.979	3298.9	.918
1965	3023.7	.966	785.0	.898	4.2	1.000	2100.6	.946	3454.9	.935
1966	3372.3	.959	856.4	.899	21.7	1.000	2378.3	.952	3631.3	.981
1967	3691.9	1.000	942.6	1.000	64.2	1.000	2540.6	1.000	3788.9	1.000
1968	4075.5	1.027	1028.4	1.028	172.7	1.030	2728.1	1.053	3987.5	1.067
1969	4480.7	1.052	1074.7	1.051	275.6	1.058	2959.1	1.117	4234.3	1.128
1970	4878.0	1.091	1084.4	1.082	514.0	1.092	3113.7	1.147	4456.0	1.199
1971	5355.8	1.147	1144.1	1.143	922.1	1.143	3276.2	1.181	4661.9	1.324
1972	5876.6	1.157	1174.6	1.158	1398.7	1.145	3507.0	1.182	4892.3	1.410
1973	6372.2	1.253	1192.2	1.267	2050.9	1.137	3800.2	1.127	5119.2	1.507
1974	6902.7	1.417	1216.9	1.398	2748.3	1.252	4117.7	1.157	5301.2	1.735
1975	7331.9	1.468	1229.9	1.492	3455.7	1.305	4448.9	1.202	5384.7	1.909
1976	7595.7	1.538	1222.9	1.608	4256.4	1.344	4836.1	1.248	5522.1	2.035
1977	7845.2	1.538	1207.6	1.695	5270.5	1.235	5333.6	1.295	5695.5	2.142
1978	8202.8	1.581	1190.3	1.885	6676.5	1.195	5874.2	1.297	5895.4	2.339
1979	8663.0	1.596	1191.6	2.042	8278.6	1.192	6472.7	1.375	6127.7	2.525

Table 9 (continued)

Year	Station Equipment: Large PBX		Pole Lines		Cable:Aerial		Cable:Underground		Cable:Buried	
	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1946	118.1	.678	1101.7	.527	1501.6	.578	1077.1	.602	240.3	.577
1947	145.3	.736	1146.8	.566	1552.2	.646	1122.4	.675	292.1	.645
1948	172.5	.698	1218.3	.564	1667.8	.714	1223.6	.763	366.3	.711
1949	193.5	.700	1269.3	.569	1786.2	.667	1306.6	.690	419.4	.664
1950	210.0	.757	1321.5	.591	1884.8	.717	1348.4	.754	442.9	.714
1951	235.4	.753	1363.5	.629	1979.9	.737	1379.9	.772	459.0	.736
1952	257.7	.670	1402.7	.666	2076.7	.748	1428.3	.770	486.0	.745
1953	282.4	.679	1443.4	.678	2197.3	.761	1481.6	.780	508.5	.758
1954	307.7	.685	1481.6	.653	2333.2	.767	1554.0	.783	517.7	.762
1955	337.2	.737	1521.1	.664	2476.9	.829	1602.9	.865	533.0	.824
1956	376.8	.760	1552.8	.714	2638.3	.850	1685.7	.882	574.1	.846
1957	415.8	.813	1569.0	.750	2808.5	.834	1810.6	.854	626.2	.841
1958	451.0	.809	1571.0	.754	2959.9	.846	1922.7	.865	681.8	.852
1959	495.9	.841	1565.5	.790	3108.8	.860	2010.8	.878	734.6	.871
1960	588.7	.842	1554.4	.787	3260.1	.881	2120.0	.899	802.0	.891
1961	697.8	.844	1541.5	.798	3369.3	.851	2208.2	.863	879.6	.857
1962	819.9	.841	1526.2	.819	3461.5	.863	2285.0	.874	983.8	.869
1963	936.0	.878	1505.7	.836	3547.9	.876	2367.8	.882	1086.8	.880
1964	1053.3	.887	1489.2	.862	3646.8	.886	2467.5	.885	1262.2	.886
1965	1164.8	.931	1472.9	.912	3766.8	.909	2566.3	.906	1445.6	.909
1966	1302.7	.953	1449.1	.965	3873.7	.984	2678.6	.990	1685.4	.985
1967	1443.0	1.000	1419.7	1.000	3965.3	1.000	2813.6	1.000	1940.4	1.000
1968	1551.6	1.062	1382.7	1.068	4030.3	1.016	2930.4	.994	2145.1	1.013
1969	1710.2	1.116	1349.8	1.118	4131.3	1.157	3101.8	1.170	2494.4	1.160
1970	1856.5	1.165	1317.1	1.263	4218.4	1.223	3307.5	1.225	2804.1	1.224
1971	1875.1	1.323	1291.2	1.362	4295.1	1.313	3574.2	1.294	3161.2	1.309
1972	1899.7	1.346	1249.8	1.475	4396.0	1.360	3812.8	1.316	3476.9	1.352
1973	1938.6	1.424	1224.3	1.781	4533.5	1.532	4081.6	1.507	3850.5	1.524
1974	1968.4	1.644	1195.8	1.916	4657.0	1.676	4344.2	1.651	4261.5	1.667
1975	1952.4	1.778	1168.8	2.122	4747.3	1.797	4521.1	1.736	4621.8	1.787
1976	1897.2	1.859	1144.8	2.243	4843.0	1.914	4644.7	1.851	4902.6	1.904
1977	1840.1	1.989	1122.7	2.398	4958.9	1.951	4798.9	1.862	5227.3	1.946
1978	1810.2	2.004	1103.0	2.615	5088.4	2.083	5012.5	1.979	5628.7	2.084
1979	1803.2	2.056	1084.9	2.873	5239.7	2.409	5263.0	2.344	6043.0	2.452

Table 9 (continued)

Year	Cable:Submarine		Aerial Wire		Underground Conduit		Furniture and Office Equipment		Vehicles and Other Work Equipment		Total Owned Capital	
	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1946	29.1	.586	624.8	.572	1016.8	.465	137.3	.595	78.7	.523	10554.1	.628
1947	31.1	.654	614.6	.634	1046.9	.511	152.5	.652	137.1	.592	11400.2	.686
1948	33.7	.725	616.0	.661	1112.0	.539	167.8	.675	179.9	.645	12752.8	.708
1950	34.5	.737	570.3	.689	1162.3	.577	170.6	.753	168.6	.694	13646.2	.698
1951	33.8	.757	547.9	.707	1171.9	.607	174.6	.788	165.7	.734	14110.8	.744
1952	33.9	.761	524.1	.755	1189.4	.635	184.0	.784	171.3	.751	14573.1	.762
1953	34.1	.774	503.5	.797	1209.3	.663	193.0	.796	177.7	.757	15194.9	.751
1954	35.3	.778	492.7	.806	1234.1	.678	200.7	.817	184.9	.773	16087.4	.767
1955	35.0	.850	481.9	.836	1258.3	.705	212.3	.859	220.7	.812	17033.8	.773
1956	57.3	.865	484.0	.838	1311.0	.740	227.1	.900	258.5	.860	17944.8	.805
1957	77.6	.841	488.9	.871	1390.9	.767	227.6	.946	249.8	.898	19111.2	.833
1958	76.7	.854	485.9	.879	1438.4	.788	225.2	.959	233.5	.935	20723.6	.855
1959	88.7	.868	480.9	.900	1474.0	.799	225.6	.963	226.9	.933	22059.7	.862
1960	90.7	.888	476.9	.906	1533.7	.804	228.3	.969	234.1	.936	23102.6	.870
1961	88.2	.858	468.2	.906	1571.4	.817	229.8	.950	234.9	.935	24374.3	.876
1962	87.5	.869	458.8	.861	1597.7	.830	240.5	.939	246.5	.938	25743.3	.869
1963	109.6	.880	444.7	.858	1636.1	.845	258.0	.944	262.5	.937	27282.1	.875
1964	145.6	.887	430.5	.873	1690.4	.870	273.2	.941	282.3	.949	28793.3	.894
1965	149.9	.910	415.1	.892	1750.5	.893	289.6	.933	304.7	.953	30578.9	.903
1966	155.5	.989	377.6	.939	1821.6	.942	288.6	.957	324.8	.971	32496.8	.920
1967	153.0	1.000	341.2	1.000	1892.9	1.000	293.5	1.000	332.1	1.000	34564.8	.961
1968	160.1	.997	305.1	1.065	1961.3	1.057	310.3	1.041	353.4	1.030	36434.5	1.000
1969	154.7	1.166	275.7	1.175	2078.3	1.135	323.8	1.083	390.0	1.061	38337.4	1.043
1970	161.3	1.223	249.9	1.262	2258.1	1.212	348.4	1.140	452.9	1.125	40805.8	1.121
1971	155.5	1.294	226.6	1.314	2430.3	1.341	376.7	1.165	481.9	1.164	43510.8	1.189
1972	148.2	1.319	207.3	1.370	2589.8	1.442	402.1	1.186	520.1	1.178	46473.8	1.276
1973	141.3	1.504	190.7	1.500	2788.9	1.584	429.2	1.238	565.4	1.220	49590.0	1.321
1974	151.1	1.653	173.2	1.712	2993.9	1.809	495.7	1.449	596.7	1.465	53056.8	1.440
1975	162.4	1.745	157.2	1.874	3100.8	1.980	586.4	1.472	569.5	1.583	56309.5	1.624
1976	186.7	1.860	142.8	1.967	3174.5	2.107	703.8	1.522	574.8	1.678	58741.7	1.741
1977	177.4	1.877	129.8	2.085	3268.9	2.245	823.1	1.545	599.9	1.802	60663.1	1.849
1978	169.6	1.998	120.1	2.214	3419.1	2.448	993.9	1.603	639.3	1.949	62731.5	1.914
1979	160.8	2.408	112.3	2.521	3594.0	2.730	1202.9	1.682	713.9	2.129	68401.3	2.179

Table 10

Value Shares of Capital Stock by Type

Year	Buildings	COE: Manual	COE: Panel	COE: Step by Step	COE: Crossbar
1950	.116	.046	.019	.071	.060
1960	.124	.018	.009	.066	.083
1970	.128	.006	.003	.052	.103
1979	.135	.002	.000	.027	.091

	COE: Toll	COE: Radio	COE: Electronic	Station Equipment: Station Apparatus	Station Equipment: Station Connections
1950	.038	.003	.000	.068	.107
1960	.073	.014	.000	.066	.107
1970	.103	.023	.011	.069	.103
1979	.093	.016	.066	.060	.104

	Station Equipment: Large PBX	Pole Lines	Cable:Aerial	Cable: Underground	Cable: Buried
1950	.015	.074	.129	.097	.038
1960	.023	.057	.135	.089	.033
1970	.043	.032	.100	.078	.066
1979	.025	.021	.085	.083	.099

	Cable Submarine	Aerial Wire	Underground Conduit	Furniture and Office Equipment	Vehicles and Other Work Equipment
1950	.002	.037	.064	.012	.011
1960	.004	.020	.058	.010	.010
1970	.004	.006	.053	.008	.010
1979	.003	.002	.066	.014	.010

Formula (1) above holds only in the absence of taxation. Christensen and Jorgenson (1969) show that the appropriate formula in the presence of income and property taxes is:

$$(2)\quad p_{Kt}K_t = \frac{1 - u_t z_t - k_t + y_t}{1 - u_t}\left[p_{A,t-1}r_t + p_{A,t}\delta - (p_{A,t} - p_{A,t-1})\right] K^A_{t-1} + p_{A,t-1}T_t K^A_{t-1}$$

where u_t is the effective corporate profits tax rate

z_t is the present value of imputed depreciation allowances on one dollar's worth of investment

k_t is the investment tax credit, different from zero for some years for all capital types except buildings

y_t is $k_t u_t z_t$ in 1962 and 1963 and is set equal to zero for all other years; it is used to account for the fact that the investment tax credit was deducted from the value of an asset for depreciation in those years

T_t is the property tax rate

The Bell System effective corporate profits tax rate is estimated as the ratio of income taxes paid plus the investment tax credit to property compensation less property taxes and the imputed value of depreciation allowances for tax purposes.

Income taxes paid are federal plus state and local income taxes. The Bell System Statistical Manual (BSSM) gives federal income taxes and the Productivity Studies Department of AT&T has supplied figures on state and local income taxes. The BSSM also provides the amount of the investment tax credit.

Imputed depreciation allowances depend on depreciation formulas allowed for tax purposes, the lifetimes of assets used for calculating tax depreciation and the opportunity cost of capital. We assume the appropriate opportunity cost for

Bell System Capital Cost

Year	Cost of Capital
1947	.070
1948	.070
1949	.070
1950	.070
1951	.070
1952	.070
1953	.070
1954	.070
1955	.070
1956	.070
1957	.070
1958	.070
1959	.070
1960	.070
1961	.070
1962	.070
1963	.070
1964	.085
1965	.085
1966	.085
1967	.085
1968	.095
1969	.085
1970	.095
1971	.095
1972	.095
1973	.095

discounting future depreciation allowances is the forward looking Bell System cost of capital. Between 1947 and 1969 straight line depreciation allowances were used by the Bell System. Appropriate lifetimes are given in Account 608. Beginning in 1970 we use Engineering Economy to specify depreciation formulas. This specifies a 1.5 declining balance formula for structures, while for all other capital it specifies double declining balance switching to a sum of years digit formula at the optimal point. Table 12 gives the lives specified in Account 608 and, for 1970 and for later, those specified in Depreciation Guide published by the Commerce Clearing House.

The property tax rate is the ratio of all operating taxes related to capital input to the value of the total capital stock at the beginning of the period. Operating taxes related to capital input include property taxes, capital stock taxes, franchises, and permits.

We assume that the real flow of capital services from each type of asset is proportional to the stock of the asset at the end of the previous period

$$K_{it} = q_{Ki} K^{A}_{it-1} .$$

The price per unit of capital services can be obtained by dividing the service flow by the lagged stock and normalizing to unity in the base year. We present these prices normalized to unity in 1967 and their corresponding service flows in Table 13.

5.3. Capital Input from Rented Capital. Expenditures for rented capital are contained in BSPS under the general heading of "materials, rents, and services." The expenditures represent the value of capital services from rented capital goods. The bulk of these capital goods are structures. It is necessary to separate the expenditures into price and quantity components. We use the CPI rent index to

Table 12

Tax Lives Used to Estimate Depreciation

Year	Building	COE: Manual	COE: Panel	COE: Step by Step	COE: Crossbar
1950	42.0	11.6	31.0	31.0	31.0
1960	43.0	15.3	26.0	26.0	30.0
1970	36.0	16.0	16.0	16.0	16.0
1979	36.0	16.0	16.0	16.0	16.0

	COE: Toll	COE: Radio	COE: Electronic	Station Equipment: Station Apparatus	Station Equipment: Station Connections
1950	19.4	12.6		16.4	16.4
1960	21.0	9.3		16.8	9.2
1970	16.0	16.0	16.0	8.0	8.0
1979	16.0	16.0	16.0	8.0	8.0

	Station Equipment: Large PBX	Pole Lines	Cable: Aerial	Cable: Underground	Cable: Buried
1950	19.0	25.0	29.0	36.5	30.5
1960	17.7	24.5	32.0	43.0	31.5
1970	8.0	28.0	28.0	28.0	28.0
1979	8.0	28.0	28.0	28.0	28.0

	Cable: Submarine	Aerial Wire	Underground Conduit	Furniture and Office Equipment	Vehicles and Other Work Equipment
1950	22.5	21.8	67.0	20.3	7.5
1960	24.0	20.6	66.0	20.0	7.5
1970	28.0	28.0	28.0	7.5	5.0
1979	28.0	28.0	28.0	7.5	5.0

Table 13

Owned Capital Input
(millions of 1967 dollars)

	Buildings		COE:Manual		COE:Panel		COE:Step by Step		COE:Crossbar	
Year	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1947	192.1	.102	181.5	.477	55.8	.368	115.1	.578	48.2	.714
1948	209.7	.234	199.8	.515	65.4	.405	129.5	.634	62.3	.772
1949	244.4	.270	217.7	.532	74.6	.404	148.1	.601	86.4	.730
1950	272.9	.314	210.7	.570	76.5	.442	163.0	.666	107.5	.801
1951	279.7	.352	196.3	.647	75.6	.505	170.5	.763	119.6	.898
1952	285.3	.449	184.0	.660	74.9	.575	177.9	.925	127.9	1.096
1953	293.9	.520	181.4	.669	74.8	.533	185.1	.799	136.7	.943
1954	306.7	.543	188.7	.683	75.9	.552	201.7	.822	151.8	.951
1955	324.8	.574	184.3	.742	76.2	.576	216.1	.864	172.4	1.019
1956	338.4	.611	173.1	.742	75.2	.569	228.0	.865	193.3	.983
1957	360.5	.678	172.5	.725	74.8	.519	243.2	.743	221.7	.825
1958	389.8	.723	173.4	.779	74.8	.605	266.4	.832	263.7	.956
1959	416.0	.788	168.8	.812	74.9	.602	281.5	.837	297.5	.972
1960	431.4	.858	156.5	.824	76.1	.654	289.6	.943	321.8	1.037
1961	450.6	.905	147.2	.830	76.5	.663	303.7	.942	346.1	1.106
1962	470.7	.952	135.5	.883	78.2	.689	314.8	1.005	385.0	1.191
1963	489.0	.974	126.3	.894	81.8	.650	325.7	.953	431.8	1.128
1964	509.3	1.060	116.5	.924	82.6	.687	332.9	1.071	481.6	1.190
1965	535.3	1.022	105.6	.913	82.4	.654	341.6	.964	527.6	1.167
1966	568.9	1.021	97.8	.965	83.2	1.010	353.5	1.031	575.0	1.092
1967	603.0	1.000	91.9	1.000	73.5	1.000	365.2	1.000	625.3	1.000
1968	628.5	1.018	87.0	1.068	66.0	1.071	374.5	1.059	673.6	1.038
1969	654.7	.984	85.9	1.109	60.5	1.138	381.6	1.069	708.4	1.070
1970	685.0	1.015	82.3	1.157	55.4	1.046	392.3	1.089	766.4	.911
1971	729.9	.940	74.6	1.115	51.8	1.046	406.3	1.313	835.1	.897
1972	781.8	.941	73.2	1.180	47.6	1.104	412.1	1.484	914.2	1.001
1973	830.2	.838	70.9	1.168	41.6	1.038	415.7	1.375	1012.8	.910
1974	884.4	.733	65.6	1.248	32.1	1.057	418.1	1.301	1111.5	.767
1975	924.1	1.154	59.9	1.351	24.9	1.196	414.2	1.562	1187.1	1.003
1976	954.5	1.395	55.8	1.536	19.0	1.323	404.1	1.787	1235.9	1.088
1977	980.9	1.499	48.9	1.612	13.5	1.424	386.5	1.848	1236.2	1.122
1978	998.1	1.570	42.6	1.792	6.4	1.571	367.8	2.201	1226.6	1.370
1979	1005.4	1.896	36.9	1.895	1.6	1.685	346.4	2.397	1217.8	1.589

Table 13 (continued)

Year	COE:Toll		COE:Radio		COE:Electronic		Station Equipment: Station Apparatus		Station Equipment: Station Connections	
	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1947	20.7	.730	.0	.000	.0	.000	126.9	1.786	390.3	.387
1948	38.3	.767	.0	.000	.0	.000	125.7	1.936	405.3	.421
1949	63.0	.755	.0	.000	.0	.000	135.5	1.748	425.7	.441
1950	76.9	.803	3.5	.857	.0	.000	141.1	1.953	442.0	.471
1951	82.3	.903	6.0	.968	.0	.000	146.5	2.298	459.7	.501
1952	92.0	1.067	8.8	1.122	.0	.000	149.8	2.434	483.9	.537
1953	107.7	.940	11.8	1.032	.0	.000	159.2	2.096	506.7	.572
1954	134.1	.926	16.7	1.025	.0	.000	173.7	2.161	529.4	.585
1955	157.6	1.058	23.9	1.212	.0	.000	189.7	2.339	550.7	.628
1956	170.0	1.011	26.8	1.159	.0	.000	216.2	2.300	583.7	.625
1957	192.5	.873	30.4	1.031	.0	.000	248.5	1.186	578.0	.610
1958	234.4	.980	37.5	1.039	.0	.000	276.0	1.187	618.6	.664
1959	279.4	1.039	47.1	1.076	.0	.000	297.1	1.259	650.3	.754
1960	310.6	1.013	52.0	1.010	.0	.000	329.4	1.166	673.0	.761
1961	351.2	1.019	59.4	1.074	.0	.000	361.4	1.150	695.8	.787
1962	404.0	1.110	69.8	1.070	.0	.000	398.7	1.109	719.6	.801
1963	464.7	1.022	82.9	1.041	.0	.000	444.5	1.099	749.6	.820
1964	527.3	1.123	94.1	1.147	.0	.000	479.8	1.072	778.2	.876
1965	603.1	1.075	111.4	1.150	.2	1.133	516.1	1.085	811.9	.923
1966	673.6	1.097	133.5	1.124	.7	.989	561.4	1.050	850.2	.942
1967	751.3	1.000	162.2	1.000	3.9	1.000	612.4	1.000	893.7	1.000
1968	822.5	1.092	178.6	1.145	11.5	1.043	654.1	1.020	932.4	.997
1969	907.9	1.070	194.8	1.135	30.8	1.100	702.4	1.040	981.3	1.065
1970	998.2	.996	203.6	1.121	49.2	.963	761.9	.997	1042.0	1.110
1971	1086.7	.913	205.4	1.017	91.8	.874	801.7	.963	1096.6	1.080
1972	1193.1	.961	216.7	1.147	164.6	.883	843.5	.995	1147.3	1.126
1973	1309.2	.867	222.5	1.030	249.7	.896	903.0	1.050	1204.0	1.167
1974	1419.6	.822	225.8	1.027	366.2	.777	978.4	1.019	1259.8	1.140
1975	1537.8	.981	230.5	1.125	490.7	.893	1060.2	1.024	1304.6	1.309
1976	1633.4	1.046	233.0	1.208	617.0	.981	1145.5	1.076	1325.2	1.514
1977	1692.2	1.117	231.6	1.261	759.9	1.142	1245.2	1.084	1359.0	1.626
1978	1747.7	1.189	228.7	1.301	941.0	1.101	1373.2	1.110	1401.6	1.701
1979	1827.4	1.322	225.5	1.443	1192.0	1.162	1512.4	1.057	1450.8	1.904

Table 13 (continued)

Year	Station Equipment: Large PBX		Pole Lines		Cable:Aerial		Cable:Underground		Cable:Buried	
	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1947	24.4	.568	202.0	.361	266.6	.282	171.5	.246	40.5	.266
1948	30.0	.620	210.3	.399	275.5	.340	178.7	.305	49.2	.323
1949	35.6	.568	223.4	.401	296.1	.400	194.9	.381	61.7	.381
1950	40.0	.640	232.7	.444	317.1	.397	208.1	.354	70.7	.375
1951	43.4	.735	242.3	.487	334.6	.460	214.7	.432	74.6	.439
1952	48.6	.879	250.0	.525	351.5	.559	219.7	.570	77.3	.548
1953	53.2	.759	257.2	.562	368.7	.666	227.4	.721	81.9	.657
1954	58.3	.775	264.7	.625	390.1	.614	235.9	.611	85.7	.599
1955	63.5	.813	271.7	.635	414.2	.625	247.5	.608	87.2	.607
1956	69.6	.849	278.9	.635	439.7	.695	255.2	.703	89.8	.688
1957	77.8	.758	284.7	.724	468.4	.795	268.4	.803	96.7	.756
1958	85.9	.849	287.7	.791	498.6	.899	288.3	.798	105.5	.771
1959	93.1	.813	288.0	.724	525.4	.825	306.2	.815	114.9	.783
1960	102.4	.905	287.0	.783	551.9	.907	320.2	.954	123.8	.872
1961	121.6	.910	285.0	.829	578.7	1.002	337.6	1.057	135.1	.976
1962	144.1	.972	282.6	.867	598.1	.927	351.6	.948	148.2	.924
1963	169.3	.921	279.8	.889	614.5	.946	363.9	.977	165.7	.949
1964	193.3	1.041	276.1	.967	629.8	1.030	377.1	1.070	183.1	1.045
1965	217.5	.980	273.0	.926	647.4	1.028	392.9	1.062	212.6	1.041
1966	240.6	1.037	270.1	.954	668.7	.919	408.7	.898	243.5	.911
1967	269.1	1.000	265.7	1.000	687.7	1.000	426.5	1.000	283.9	1.000
1968	298.0	1.045	260.3	.998	703.9	1.045	448.0	1.071	326.9	1.045
1969	326.5	1.084	253.5	1.069	715.5	.861	466.6	.732	361.4	.819
1970	353.2	1.058	247.5	1.011	733.4	.967	493.9	.889	420.2	.938
1971	383.4	1.288	241.5	1.059	748.8	.953	526.7	.916	472.4	.932
1972	387.3	1.444	234.9	1.033	762.5	.968	569.2	.930	532.5	.944
1973	392.4	1.425	229.1	.820	780.4	.768	607.1	.621	585.7	.725
1974	400.4	1.375	224.5	1.058	804.8	.936	649.9	.856	648.7	.903
1975	406.5	1.596	219.3	1.202	826.7	1.077	691.8	1.041	717.9	1.046
1976	403.3	1.818	214.3	1.462	842.7	1.214	719.9	1.106	778.6	1.173
1977	391.8	1.891	209.9	1.552	859.7	1.350	739.6	1.242	825.9	1.299
1978	380.0	2.115	205.8	1.875	880.3	1.470	764.2	1.385	880.6	1.417
1979	373.9	2.232	202.2	1.899	903.3	1.327	798.2	1.141	948.2	1.213

Table 13 (continued)

Year	Cable:Submarine		Aerial Wire		Underground Conduit		Furniture and Office Equipment		Vehicles and Other Work Equipment	
	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index	Quantity Index	Price Index
1947	5.9	.307	190.9	.328	140.0	.195	29.5	.323	25.2	.396
1948	6.2	.365	187.8	.375	144.2	.238	32.8	.373	43.9	.463
1949	6.8	.428	188.3	.399	153.1	.268	36.1	.396	57.6	.517
1950	7.1	.422	181.8	.409	158.4	.316	36.8	.453	56.1	.563
1951	6.9	.495	174.3	.475	160.1	.358	36.7	.525	54.0	.599
1952	6.8	.566	167.4	.496	161.4	.424	37.6	.621	53.0	.667
1953	6.8	.682	160.2	.540	163.8	.475	39.6	.648	54.8	.722
1954	6.9	.641	153.9	.555	166.5	.517	41.5	.675	56.9	.737
1955	7.1	.652	150.6	.603	169.9	.551	43.2	.730	59.2	.758
1956	7.0	.741	147.3	.647	173.3	.580	45.7	.762	70.6	.798
1957	11.5	.827	147.9	.687	180.5	.658	48.9	.794	82.7	.856
1958	15.6	.812	149.4	.761	191.5	.729	49.0	.849	79.9	.889
1959	15.4	.833	148.5	.776	198.1	.791	48.4	.903	74.7	.960
1960	17.8	.918	147.0	.803	203.0	.856	48.5	.945	72.6	.958
1961	18.2	.967	145.7	.800	211.2	.900	49.1	1.019	74.9	.964
1962	17.7	.908	143.1	.893	216.4	.960	49.4	1.051	75.2	.959
1963	17.6	.934	140.2	.864	220.0	1.002	51.7	1.055	78.9	.976
1964	22.0	1.002	135.9	.884	225.3	1.063	55.5	1.104	84.0	.992
1965	29.3	.999	131.6	.838	232.8	1.050	58.8	.972	90.3	.997
1966	30.1	.908	126.9	1.030	241.1	1.034	62.3	1.057	97.5	.997
1967	31.2	1.000	115.4	1.000	250.9	1.000	62.1	1.000	103.9	1.000
1968	30.7	1.063	104.3	1.047	260.7	1.021	63.1	1.052	106.3	1.024
1969	32.2	.842	93.2	1.075	270.1	.996	66.8	1.063	113.1	1.056
1970	31.1	1.033	84.3	1.210	286.2	.941	69.7	.941	124.8	.994
1971	32.4	1.034	76.4	1.216	311.0	.832	74.9	.961	144.9	1.013
1972	31.2	1.048	69.3	1.225	334.7	.878	81.0	.968	154.2	1.021
1973	29.8	.811	63.4	1.174	356.6	.807	86.5	.957	166.4	1.013
1974	28.4	1.020	58.3	1.244	384.1	.717	92.3	.850	180.9	.936
1975	30.4	1.164	52.9	1.381	412.3	.961	106.6	1.098	190.9	1.120
1976	32.6	1.262	48.0	1.586	427.0	1.202	126.1	1.116	182.2	1.215
1977	37.5	1.390	43.6	1.647	437.2	1.296	151.4	1.157	183.9	1.242
1978	35.6	1.511	39.7	1.821	450.2	1.387	177.1	1.196	192.0	1.330
1979	34.1	1.299	36.7	1.823	470.8	1.473	213.8	1.339	204.6	1.482

deflate rental expenditures. This index is presented in the fourth column of Table 14. The quantity index of rental capital services, which results from deflating rental expenditures, is presented in the third column of Table 14.

The final task is to infer the level of capital stock which provides the rented capital services. We assume that rented capital services are proportional to rented capital stock and we further assume that the factor of proportionality is the same as for owned structures. The resulting index of rented capital stock is presented in the first column of Table 14. We use the Bell System structures price index as the price index for rented capital stock.

5.4. Aggregate Bell System Capital Input. We compute the quantity indexes of capital stock and capital input as Tornqvist indexes of the quantity indexes of owned and rented capital from Tables 9, 13, and 14. Dividing the total value of capital stock and capital services by the quantity indexes yields the price indexes of capital stock and capital services. These price and quantity indexes are presented in Table 15.

Capital input for each type of capital is proportional to the corresponding stock. However, due to changes in composition of the aggregate capital stock, aggregate capital input is not proportional to aggregate capital stock. Therefore, it is incorrect to use aggregate capital stock to represent aggregate capital input. The ratio of aggregate capital input to aggregate capital stock provides an index of the change in composition of the aggregate capital stock. The composition index, normalized to unity in 1967, is presented in Table 15.